List of Claims

1. (currently amended) An apparatus for affecting a temperature of a piezoelectric device, comprising:

a control device operable to receive a first control signal and to excite the piezoelectric device at about at least one predetermined electrical resonant frequency of the piezoelectric device as a function of the first control signal,

wherein said electrical resonant frequency is significantly higher than a normal operating frequency such that the temperature of the piezoelectric device increases while substantially minimal mechanical movement of the piezoelectric device occurs relative to a displacement associated with said normal operating frequency.

2. (original) The apparatus of claim 1 wherein the first signal comprises an excitation signal indicative of a desired excitation of the piezoelectric device.

3. (previously amended) The apparatus of claim 2 wherein the control device is further operable to receive a temperature signal indicative of the temperature of the piezoelectric device, and the control device is further operable to excite the piezoelectric device at the about at least one predetermined electrical resonant frequency as a function of the temperature signal.

4. (original) The apparatus of claim 3 wherein the control device is operable to excite the piezoelectric device at the about at least one predetermined electrical resonant frequency as a function of the temperature signal indicating a temperature less than a predetermined value.

5. (previously amended) The apparatus of claim 1 wherein the first signal comprises a temperature signal indicative of the temperature of the piezoelectric device.

6. (original) The apparatus of claim 5 wherein the control device is operable to excite the piezoelectric device at the about at least one predetermined electrical resonant

frequency as a function of the temperature signal indicating a temperature less than a predetermined value.

7. (original) The apparatus of claim 5 wherein the control device is further operable to receive an excitation signal indicative of a desired excitation of the piezoelectric device, and the control device is further operable to excite the piezoelectric device at the about at least one predetermined electrical resonant frequency as a function of the excitation signal.

8. (original) The apparatus of claim 1 where the piezoelectric device comprises a piezoelectric actuator.

9. (original) The apparatus of claim 1 wherein the piezoelectric actuator comprises a thermally pre-stressed bender actuator.

10. (original) The apparatus of claim 1 wherein the at least one electrical resonant frequency comprises about at least one of the series resonant frequencies of the piezoelectric device.

11. (original) The apparatus of claim 1 where the at least one electrical resonant frequency comprises about the first series resonant frequency of the piezoelectric device.

12. (original) The apparatus of claim 1 wherein the at least one electrical resonant frequency comprises about at least one of the parallel resonant frequencies of the piezoelectric device.

13. (original) The apparatus of claim 1 wherein the control device comprises at least one of a microcontroller and a microprocessor.

14. (currently amended) A method for affecting a temperature of a piezoelectric device, comprising:

determining a first condition; and

exciting the piezoelectric device at about at least one predetermined electrical resonant frequency of the piezoelectric device as a function of the first condition,

wherein said electrical resonant frequency is significantly higher than a normal operating frequency such that the temperature of the piezoelectric device increases while substantially minimal mechanical movement of the piezoelectric device occurs relative to a displacement associated with said normal operating frequency.

15. (previously amended) The method of claim 14 wherein the first condition comprises a temperature indicative of the temperature of the piezoelectric device.

16. (original) The method of claim 14 wherein exciting the piezoelectric device as a function of the first condition comprises exciting the piezoelectric device when the temperature indicative of the temperature of the piezoelectric device is less than a predetermined value.

17. (original) The method of claim 14 wherein the first condition comprises a value indicative of a desired excitation of the piezoelectric device.

18. (original) The method of claim 14 wherein exciting the piezoelectric device as a function of the first condition comprises exciting the piezoelectric device when the value indicative of the desired future operation is greater than a predetermined value.

19. (currently amended) A method for affecting a temperature of a piezoelectric device, comprising:

receiving at least one of a first excitation signal indicative of a desired excitation of the piezoelectric device and a temperature signal indicative of the temperature of the piezoelectric device; and

exciting the piezoelectric device at about at least one predetermined electrical resonant frequency of the piezoelectric device as a function of at least one of the first excitation signal and the temperature signal,

wherein said electrical resonant frequency is significantly higher than a normal operating frequency such that the temperature of the piezoelectric device increases while substantially minimal mechanical movement of the piezoelectric device occurs relative to a displacement associated with said normal operating frequency.

20. (original) The method of claim 19 wherein exciting the piezoelectric device at the about at least one predetermined electrical resonant frequency as a function of the temperature signal comprises exciting the piezoelectric device at the about at least one predetermined electrical resonant frequency as a function of the temperature signal indicating a temperature less than a predetermined value.

21. (original) The method of claim 19 wherein the piezoelectric device comprises a piezoelectric actuator.

22. (original) The method of claim 19 wherein the piezoelectric actuator comprises a thermally pre-stressed bender actuator.

23. (original) The method of claim 19 wherein the at least one electrical resonant frequency comprises about at least one of the series resonant frequencies of the piezoelectric device.

24. (original) The method of claim 19 wherein the at least one electrical resonant frequency comprises about the first series resonant frequency of the piezoelectric device.

25. (original) The method of claim 19 wherein the at least one electrical resonant frequency comprises about at least one of the parallel resonant frequencies of the piezoelectric device.

26. (currently amended) A method for affecting a temperature of a piezoelectric device, comprising:

receiving an excitation signal indicative of a desired excitation of the piezoelectric device;

determining a first value indicative of the temperature of the piezoelectric device; and

exciting the piezoelectric device at about at least one predetermined electrical resonant frequency of the piezoelectric device as a function of the excitation signal and the first value,

wherein said electrical resonant frequency is significantly higher than a normal operating frequency such that the temperature of the piezoelectric device increases while substantially minimal mechanical movement of the piezoelectric device occurs relative to a displacement associated with said normal operating frequency.